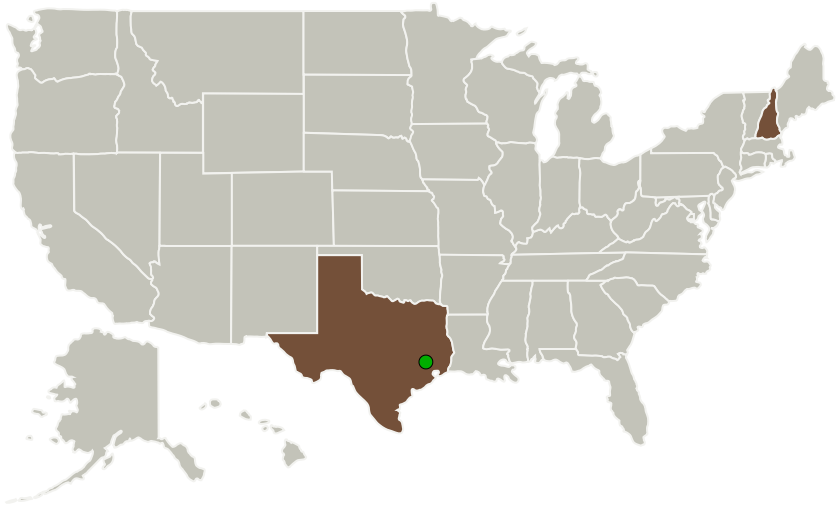
Water Recovery for Regenerative Life Support Systems, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

Thermal and environmental control systems for future exploration spacecraft must meet challenging requirements for efficient operation and conservation of resources. Regenerative CO2 removal systems are attractive for these missions because they do not use consumable CO2 absorbers. However, these systems also absorb water and vent it to space along with the carbon dioxide. This water loss can be prohibitively costly for long-duration missions. Conventional condensing heat exchangers for water conservation are not attractive, since they would add a significant load to a spacecraft's thermal control system. We propose to develop an innovative water recovery system that minimizes water lost from regenerative CO2 control systems without additional demands on the thermal control system. This approach addresses the need for water recovery systems in long-duration missions, reduces the need for consumables by enabling use of state-of-the-art regenerative CO2 removal systems, and minimizes demands on the spacecraft thermal control system. In Phase I we will prove the feasibility of our approach through proof-of-concept tests, trade-off studies, and prototype design. In Phase II we will build the prototype and measure its performance under conditions that simulate operation in a spacecraft life support system.

Primary U.S. Work Locations and Key Partners



Water Recovery for Regenerative Life Support Systems, Phase I

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Completed Technology Project (2012 - 2012)

Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
New Hampshire	Texas

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140310)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Michael G Izenson

Co-Investigator:

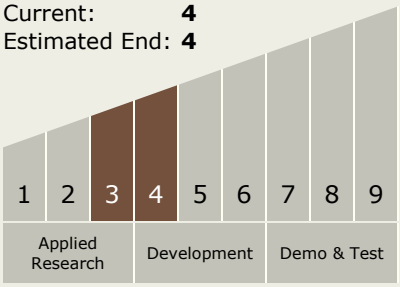
Michael Izenson

Water Recovery for Regenerative Life Support Systems, Phase I

Completed Technology Project (2012 - 2012)

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.2 Water Recovery and Management

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System